

WHAT IS CLAIMED IS:

1. A method for finding a profile of a structure on and/or below one or more layers of material, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein a measurement is carried out by directing a polychromatic beam of electromagnetic radiation at said structure and detecting at a number of wavelengths corresponding radiation data from said beam after it has been modified by the structure and the one or more layers, comprising:
  - providing a gallery of profile types, each profile type and the one or more layers associated with a set of one or more parameters and a set of radiation data at the number of wavelengths;
  - selecting a profile type from the gallery based on information on the process;
  - carrying out a measurement of the structure to obtain measured radiation data from said beam after it has been modified by the structure and the one or more layers; and
  - comparing the measured radiation data to the set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters.
2. The method of claim 1, wherein said providing provides a gallery where at least one of the profile types is defined using a polynomial function.
3. The method of claim 2, wherein said providing provides a gallery where at least one of the profile types is defined using a quartic parabola or a combination of quartic and quadratic parabolas.
4. The method of claim 1, wherein said at least one profile type comprises a periodic structure having a plurality of layers of material with different optical properties.
5. The method of claim 1, wherein said selecting includes simulating a profile using information concerning a fabrication process, and comparing the simulated profile to the gallery to select a profile type in the gallery that is a match to the simulated profile.

6. The method of claim 5, wherein said selecting further includes selecting an initial set of values of the one or more parameters of the selected profile type based on the comparison between the simulated profile and the selected profile type.

5 7. The method of claim 6, further comprising generating a set of radiation data associated with the selected profile type using the initial set of values.

8. The method of claim 1, wherein at least one of said profile types has bottom footers.  
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9. The method of claim 1, wherein said providing provides a gallery where at least one profile type in the gallery includes one or more slabs defined by an analytical function.

10 10. The method of claim 9, wherein said providing provides a gallery where at least one profile type in the gallery includes one or more rectangular or trapezoidal slabs.

11. The method of claim 1, wherein at least one of said profile types has one or more sidewall spacers or a three-dimensional structure.  
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12. The method of claim 11, wherein said sidewall spacers are composed of a material different from that of the slab(s).

13. The method of claim 1, wherein said providing provides a gallery where at  
25 least one of the profile types is defined by means of a multi-slab model.

14. The method of claim 1, wherein said one or more parameters include one or more of the following: width, height and sidewall angle, thickness and index of refraction.  
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15. The method of claim 1, wherein said comparing includes applying a non-linear optimization process.

16. The method of claim 1, wherein said profile types provided are associated with a set of radiation data related to reflectance, transmittance or ellipsometric parameters of the profile type.

5 17. The method of claim 1, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters of the profile type, said method further comprising selecting at  
10 such data to a change in the one or more parameters of the profile type and/or of the one or more layers.

18. The method of claim 1, wherein the comparing arrives at a set of value(s) of the one or more parameters of the selected profile type and/or of the one or more  
15 layers.

19. A method for finding a profile of a structure on and/or below one or more layers of material, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein a measurement is carried out by directing a  
20 polychromatic beam of electromagnetic radiation at said structure and detecting at a number of wavelengths corresponding radiation data from said beam after it has been modified by the structure, comprising:

providing a gallery of a plurality of profile types, each profile type and the one or more layers associated with a set of one or more parameters and a set of radiation data at  
25 the number of wavelengths, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said different radiation parameters including reflectance or transmittance parameters, and ellipsometric parameters of the profile type;

selecting a profile type from the gallery, at least one radiation parameter and at  
30 least one set of radiation data associated with such profile type based on sensitivity of such data to a change in the one or more parameters of the profile type and/or of the one or more layers;

carrying out a measurement of the structure to obtain measured radiation data from said beam after it has been modified by the structure at the number of wavelengths; and

5 comparing the measured radiation data to the at least one set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters.

20. The method of claim 19, wherein said selecting selects a radiation parameter and one or more sets of radiation data based on sensitivity of such data to a change in the profile parameters associated with the profile type and/or with the one or more layers.

21. The method of claim 19, wherein said providing provides a gallery where at least one of the profile types is defined using a polynomial function.

15 22. The method of claim 21, wherein said providing provides a gallery where at least one of the profile types is defined using a quartic parabola or a combination of quartic and quadratic parabolas.

20 23. The method of claim 19, wherein said at least one profile type comprises a periodic structure having a plurality of layers of material with different optical properties.

24. The method of claim 19, wherein said selecting includes simulating a profile using information concerning a fabrication process, and comparing the simulated profile to the gallery to select a profile type in the gallery that is a match to the simulated profile.

25 25. The method of claim 24, wherein said selecting further includes selecting an initial set of values of the one or more parameters of the selected profile type based on the comparison between the simulated profile and the selected profile type.

30 26. The method of claim 25, further comprising generating a set of radiation data associated with the selected profile type using the initial set of values.

27. The method of claim 19, wherein at least one of said profile types has bottom footers.

5 28. The method of claim 19, wherein said providing provides a gallery where at least one profile type in the gallery includes one or more slabs defined by an analytical function.

29. The method of claim 28, said providing provides a gallery where at least  
10 one profile type in the gallery includes one or more rectangular or trapezoidal slabs.

30. The method of claim 19, wherein at least one of said profile types has one or more sidewall spacers or a three-dimensional structure.

15 31. The method of claim 30, wherein said sidewall spacers are composed of a material different from that of the slab(s).

32. The method of claim 19, wherein said providing provides a gallery where at least one of the profile types is defined by means of a multi-slab model.

20 33. The method of claim 19, wherein said one or more parameters include one or more of the following: width, height and sidewall angle, thickness and index of refraction.

25 34. The method of claim 19, wherein said comparing includes applying non-linear optimization.

35. The method of claim 19, wherein said profile types provided are associated with a set of radiation data related to reflectance, transmittance or  
30 ellipsometric parameters of the profile type.

36. The method of claim 19, wherein the comparing arrives at a set of value(s) of the one or more parameters of the selected profile type and/or of the one or more layers.

5 37. A method for measuring one or more parameters of a diffracting structure, comprising:  
directing a beam of polychromatic electromagnetic radiation to the structure;  
collecting radiation from the beam after it has been modified by the structure;  
detecting reflectance or transmittance parameters and ellipsometric parameters of  
10 the collected radiation at a number of wavelengths; and  
deriving the one or more parameters from the detected parameters.

38. The method of claim 37, said structure situated on and/or below one or more layers of material, said method further comprising providing a gallery of a plurality  
15 of profile types, each profile type and the one or more layers associated with a set of one or more parameters and a set of radiation data, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters; said method further comprising:

20 selecting a profile type from the gallery;  
selecting at least one set of radiation data from the sets of radiation data of different parameters associated with the selected profile type based on sensitivity of such data to a change in the one or more parameters of the profile type and/or of the one or more layers; and

25 wherein said deriving includes comparing the detected parameters to the set selected to arrive at a set of value(s) of the one or more parameters of the profile type and/or of the one or more layers.

39. The method of claim 38, further comprising selecting a radiation  
30 parameter and one or more sets of radiation data based on sensitivity of such data to a change in the profile parameters associated with the profile type and/or with the one or more layers

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40. The method of claim 37, said method further comprising providing a gallery of a plurality of profile types, each profile type associated with a set of one or more parameters and a set of radiation data, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters; said method further comprising:

5 selecting a profile type from the gallery;  
selecting at least one set of radiation data from the sets of radiation data of different parameters associated with the selected profile type based on sensitivity of such data to a change in the one or more parameters; and  
10 wherein said deriving includes comparing the detected parameters to the set selected to arrive at a set of value(s) of the one or more parameters.

41. An apparatus for measuring one or more parameters of a diffracting structure, comprising:

15 a device directing a polychromatic beam of polarized electromagnetic radiation to the structure;  
optics collecting radiation from the beam after it has been modified by the structure;

20 at least one detector detecting at a number of wavelengths reflectance or transmittance parameters and ellipsometric parameters of the collected radiation;

a database providing a gallery of a plurality of profile types, each profile type having a set of one or more parameters and associated with a set of radiation data of radiation parameters at the number of wavelengths, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters; and

25 a processor selecting a profile type from the gallery, at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type, and comparing the detected parameters to the at least one set for the selected profile type to arrive at a set of value(s) of the one or more parameters.  
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42. The apparatus of claim 41, wherein at least one of said profile types in the gallery provided includes a periodic structure on and/or below one or more layers of material, and the sets of data include a set of data corresponding to said at least one of said profile types.

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43. The apparatus of claim 42, said processor selecting a radiation parameter and one or more sets of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type, and a change in a characteristic of the one or more layers.

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44. An integrated processing and detection apparatus for processing a sample having structures thereon, comprising:

a system that finds a profile of a structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein the system measures the structure by directing a polychromatic beam of electromagnetic radiation at said structure, detects corresponding radiation data from said beam after it has been modified by the structure at a number of wavelengths from said structure and analyzes the data to provide information related to the structures; and

a processing system processing the sample in response to said information for adjusting a processing parameter.

45. The apparatus of claim 44, said system providing a gallery of a plurality of profile types, each profile type associated with a set of one or more parameters and a set of radiation data, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters; wherein said system:

selects a profile type from the gallery; and

selects at least one set of radiation data from the sets of radiation data of different parameters associated with the selected profile type based on sensitivity of such data to a change in the one or more parameters;

wherein said analyzing includes comparing the detected parameters to the set selected to arrive at a set of value(s) of the one or more parameters.



46. The apparatus of claim 45, wherein at least one of said profile types in the gallery provided includes a periodic structure on and/or below one or more layers of material, and the sets of data include one set corresponding to said at least one of said profile types and the one or more layers.

47. The apparatus of claim 46, said processor selecting a radiation parameter and one or more sets of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type, and a change in a characteristic of the one or more layers.

48. The apparatus of claim 46, wherein said one or more parameters include one or more of the following: width, height and sidewall angle, thickness and index of refraction.

49. A computer readable storage device embodying a program of instructions executable by a computer to perform a method for finding a profile of a structure on and/or below one or more layers of material, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein a measurement is carried out by directing a polychromatic beam of electromagnetic radiation at said structure, detecting at a number of wavelengths corresponding radiation data from said beam after it has been modified by the structure and the one or more layers at a number of wavelengths to provide measured radiation data; said method comprising:

providing a gallery of a plurality of profile types, each profile type and the one or more layers associated with a set of one or more parameters and a set of radiation data at the number of wavelengths;

selecting a profile type from the gallery based on information on the process; and  
comparing the measured radiation data to the set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type and/or of the one or more layers.

50. The device of claim 49, wherein said providing provides a gallery where at least one of the profile types is defined using a quartic parabola or a combination of quartic and quadratic parabolas.

5 51. The device of claim 49, wherein said at least one profile type comprises a periodic structure having a plurality of layers of material with different optical properties.

52. The device of claim 49, wherein said selecting includes simulating a profile using information concerning a fabrication process, and comparing the simulated  
10 profile to the gallery to select a profile type in the gallery that is a match to the simulated profile.

53. The device of claim 52, wherein said selecting further includes selecting an initial set of values of the one or more parameters of the selected profile type based on  
15 the comparison between the simulated profile and the selected profile type.

54. The device of claim 53, further comprising generating a set of radiation data associated with the selected profile type using the initial set of values.

20 55. The device of claim 49, wherein at least one of said profile types has bottom footers.

56. The device of claim 49, said providing provides a gallery where at least one profile type in the gallery includes one or more slabs defined by an analytical  
25 function.

57. The device of claim 56, said providing provides a gallery where at least one profile type in the gallery includes one or more rectangular or trapezoidal slabs.

30 58. The device of claim 49, wherein at least one of said profile types has one or more sidewall spacers or a three-dimensional structure.

59. The device of claim 58, wherein said sidewall spacers are composed of a material different from that of the slab(s).

60. The device of claim 49, wherein said profile types provided are associated  
5 with a set of radiation data related to reflectance, transmittance or ellipsometric parameters of the profile type.

61. The device of claim 49, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters,  
10 said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters of the profile type, said method further comprising selecting at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type and/or of the one or more layers.

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62. A computer readable storage device embodying a program of instructions executable by a computer to perform a method for finding a profile of a structure on and/or below one or more layers of material, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein the system measures the  
20 structure by directing a polychromatic beam of electromagnetic radiation at said structure, detecting corresponding radiation data from said beam after it has been modified by the structure and the one or more layers at a number of wavelengths to provide measured radiation data; said method comprising:

providing a gallery of a plurality of profile types, each profile type and the one or  
25 more layers associated with a set of one or more parameters and a set of radiation data at the number of wavelengths, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said different radiation parameters including reflectance or transmittance parameters and ellipsometric parameters;

30 selecting a profile type from the gallery, at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type and/or of the one or more layers; and

comparing the measured radiation data to the at least one set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type.

5           63.     The device of claim 62, wherein said providing provides a gallery where at least one of the profile types is defined using a quartic parabola or a combination of quartic and quadratic parabolas.

64.     The device of claim 62, wherein said at least one profile type comprises a  
10   periodic structure having a plurality of layers of material with different optical properties.

65.     The device of claim 62, wherein said selecting includes simulating a  
profile using information concerning a fabrication process, and comparing the simulated  
profile to the gallery to select a profile type in the gallery that is a match to the simulated  
15   profile.

66.     The device of claim 65, wherein said selecting further includes selecting  
an initial set of values of the one or more parameters of the selected profile type based on  
the comparison between the simulated profile and the selected profile type.  
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67.     The device of claim 66, further comprising generating a set of radiation  
data associated with the selected profile type using the initial set of values.

68.     The device of claim 62, wherein at least one of said profile types has  
25   bottom footers.

69.     The device of claim 62, wherein said providing provides a gallery where at  
least one profile type in the gallery includes one or more slabs defined by an analytical  
function.

30           70.     The device of claim 69, wherein said providing provides a gallery where at  
least one profile type in the gallery includes one or more rectangular or trapezoidal slabs.

71. The device of claim 62, wherein at least one of said profile types has one or more sidewall spacers or a three-dimensional structure.

72. The device of claim 71, wherein said sidewall spacers are composed of a material different from that of the slab(s).

73. The device of claim 63, wherein said profile types provided are associated with a set of radiation data related to reflectance, transmittance or ellipsometric parameters of the profile type.

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74. The device of claim 63, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters of the profile type, said method further comprising selecting at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type and/or of the one or more layers.

75. A method for transmitting a program of instructions executable by a computer to perform a method for finding a profile of a structure on and/or below one or more layers of material, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein the system measures the structure by directing a polychromatic beam of electromagnetic radiation at said structure, detecting corresponding radiation data from said beam after it has been modified by the structure and the one or more layers at a number of wavelengths to provide measured radiation data; said method comprising:

causing a program of instructions to be transmitted to a client device, thereby enabling the client device to perform, by means of such program, the following process:

providing a gallery of profile types, each profile type and the one or more layers associated with a set of one or more parameters and a set of radiation data at the number of wavelengths;

selecting a profile type from the gallery based on information on the process; and

comparing the measured radiation data to the set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type to arrive at a set of value(s) of the one or more parameters.

5           76.    The method of claim 75, wherein said providing provides a gallery where at least one of the profile types is defined using a quartic parabola or a combination of quartic and quadratic parabolas.

10           77.    The method of claim 75, wherein said at least one profile type comprises a periodic structure having a plurality of layers of material with different optical properties.

15           78.    The method of claim 75, wherein said selecting includes simulating a profile using information concerning a fabrication process, and comparing the simulated profile to the gallery to select a profile type in the gallery that is a match to the simulated profile.

20           79.    The method of claim 78, wherein said selecting further includes selecting an initial set of values of the one or more parameters of the selected profile type based on the comparison between the simulated profile and the selected profile type.

25           80.    The method of claim 79, further comprising generating a set of radiation data associated with the selected profile type using the initial set of values.

30           81.    The method of claim 75, wherein at least one of said profile types has bottom footers.

            82.    The method of claim 75, wherein said providing provides a gallery where at least one profile type in the gallery includes one or more slabs defined by an analytical function.

30           83.    The method of claim 82, said providing provides a gallery where at least one profile type in the gallery includes one or more rectangular or trapezoidal slabs.

84. The method of claim 75, wherein at least one of said profile types has one or more sidewall spacers or a three-dimensional structure.

85. The method of claim 84, wherein said sidewall spacers are composed of a material different from that of the slab(s).

86. The method of claim 75, wherein said profile types provided are associated with a set of radiation data related to reflectance, transmittance or ellipsometric parameters of the profile type.

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87. The method of claim 75, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said radiation parameters including reflectance or transmittance parameters and ellipsometric parameters of the profile type, said process further comprising selecting at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type and/or of the one or more layers.

88. A method for transmitting a program of instructions executable by a computer to perform a method for finding a profile of a structure on and/or below one or more layers of material, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein the system measures the structure by directing a polychromatic beam of electromagnetic radiation at said structure, detecting corresponding radiation data from said beam after it has been modified by the structure and the one or more layers at a number of wavelengths to provide measured radiation data; said method comprising:

causing a program of instructions to be transmitted to a client device, thereby enabling the client device to perform, by means of such program, the following process:

providing a gallery of profile types, each profile type and the one or more layers associated with a set of one or more parameters and a set of radiation data at the number of wavelengths, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said different radiation

parameters including reflectance or transmittance parameters and ellipsometric parameters;

selecting a profile type from the gallery, at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters of the profile type and/or of the one or more layers; and

comparing the measured radiation data to the at least one set of radiation data to arrive at a set of value(s) of the one or more parameters.

89. The method of claim 88, wherein said providing provides a gallery where at least one of the profile types is defined using a quartic parabola or a combination of quartic and quadratic parabolas.

90. The method of claim 88, wherein said at least one profile type comprises a periodic structure having a plurality of layers of material with different optical properties.

91. The method of claim 88, wherein said selecting includes simulating a profile using information concerning a fabrication process, and comparing the simulated profile to the gallery to select a profile type in the gallery that is a match to the simulated profile.

92. The method of claim 91, wherein said selecting further includes selecting an initial set of values of the one or more parameters of the selected profile type based on the comparison between the simulated profile and the selected profile type.

93. The method of claim 92, further comprising generating a set of radiation data associated with the selected profile type using the initial set of values.

94. The method of claim 88, wherein at least one of said profile types has bottom footers.

95. The method of claim 88, wherein said providing provides a gallery where at least one profile type in the gallery includes one or more slabs defined by an analytical function.



96. The method of claim 95, said providing provides a gallery where at least one profile type in the gallery includes one or more rectangular or trapezoidal slabs.

5 97. The method of claim 88, wherein at least one of said profile types has one or more sidewall spacers or a three-dimensional structure.

98. The method of claim 97, wherein said sidewall spacers are composed of a material different from that of the slab(s).

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99. A method for finding a profile of a structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein a measurement is carried out by directing a polychromatic beam of electromagnetic radiation at said structure and detecting at a number of wavelengths corresponding radiation data from said beam after it has been modified by the structure, comprising:

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providing a gallery of profile types, each profile type associated with a set of one or more parameters and a set of radiation data at the number of wavelengths;

selecting a profile type from the gallery based on information on the process;

carrying out a measurement of the structure to obtain measured radiation data

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from said beam after it has been modified by the structure; and

comparing the measured radiation data to the set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type.

25 100. A method for finding a profile of a structure, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein a measurement is carried out by directing a polychromatic beam of electromagnetic radiation at said structure and detecting at a number of wavelengths corresponding radiation data from said beam after it has been modified by the structure, comprising:

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providing a gallery of a plurality of profile types, each profile type associated with a set of one or more parameters and a set of radiation data at the number of wavelengths of different radiation parameters, wherein at least one of said profile types provided is associated with a plurality of sets of different radiation data, said different radiation

parameters including reflectance or transmittance parameters, and ellipsometric parameters of the profile type;

selecting a profile type from the gallery, at least one radiation parameter and at least one set of radiation data associated with such profile type based on sensitivity of such data to a change in the one or more parameters;

carrying out a measurement of the structure to obtain measured radiation data from said beam after it has been modified by the structure at the number of wavelengths; and

comparing the measured radiation data to the at least one set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type.

101. A computer readable storage device embodying a program of instructions executable by a computer to perform a method for finding a profile of a structure, said structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein a measurement is carried out by directing a polychromatic beam of electromagnetic radiation at said structure, detecting at a number of wavelengths corresponding radiation data from said beam after it has been modified by the structure at a number of wavelengths to provide measured radiation data; said method comprising:

providing a gallery of a plurality of profile types, each profile associated with a set of one or more parameters and a set of radiation data at the number of wavelengths;

selecting a profile type from the gallery based on information on the process; and

comparing the measured radiation data to the set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type.

102. A computer readable storage device embodying a program of instructions executable by a computer to perform a method for finding a profile of a structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein the system measures the structure by directing a polychromatic beam of electromagnetic radiation at said structure, detecting corresponding radiation data from said beam after it has been modified by the structure at a number of wavelengths to provide measured radiation data; said method comprising:

providing a gallery of a plurality of profile types, each profile associated with a set of one or more parameters and a set of radiation data at the number of wavelengths, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said different radiation parameters including reflectance or transmittance parameters and ellipsometric parameters;

selecting a profile type from the gallery, at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters; and

comparing the measured radiation data to the at least one set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type.

103. A method for transmitting a program of instructions executable by a computer to perform a method for finding a profile of a structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein the system measures the structure by directing a polychromatic beam of electromagnetic radiation at said structure, detecting corresponding radiation data from said beam after it has been modified by the structure at a number of wavelengths to provide measured radiation data; said method comprising:

causing a program of instructions to be transmitted to a client device, thereby enabling the client device to perform, by means of such program, the following process:

providing a gallery of profile types, each profile type associated with a set of one or more parameters and a set of radiation data at the number of wavelengths;

selecting a profile type from the gallery based on information on the process; and

comparing the measured radiation data to the set of radiation data associated with the selected profile type to arrive at a set of value(s) of the one or more parameters of the selected profile type to arrive at a set of value(s) of the one or more parameters.

104. A method for transmitting a program of instructions executable by a computer to perform a method for finding a profile of a structure having a dimension in the micron or sub-micron range and fabricated by a process, wherein the system measures the structure by directing a polychromatic beam of electromagnetic radiation at said structure, detecting corresponding radiation data from said beam after it has been

modified by the structure at a number of wavelengths to provide measured radiation data; said method comprising:

causing a program of instructions to be transmitted to a client device, thereby enabling the client device to perform, by means of such program, the following process:

5 providing a gallery of profile types, each profile type associated with a set of one or more parameters and a set of radiation data at the number of wavelengths, wherein at least one of said profile types provided is associated with a plurality of sets of radiation data of different radiation parameters, said different radiation parameters including reflectance or transmittance parameters and ellipsometric parameters;

10 selecting a profile type from the gallery, at least one radiation parameter and at least one set of radiation data based on sensitivity of such data to a change in the one or more parameters; and

comparing the measured radiation data to the at least one set of radiation data to arrive at a set of value(s) of the one or more parameters.